

### Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application.

### Listing of the Claims

1. (Currently Amended) A method of controlling the crystalline structure of ingots and castings of ferrous and non-ferrous metals, in which ~~[[the]]~~ a melt is crystallized in helically traveling magnetic fields excited by *m*-phase systems of helical alternating currents, ~~wherein said currents are hierarchically frequency and amplitude modulated, wherein said modulation is superimposed on said *m* phase systems of currents in the form of pulses~~ the method comprising:

applying a train of said *m*-phase systems of alternating currents in a superwave pattern to excite said helically traveling magnetic fields, a cluster of intensified energy pulses being superimposed on each *m*-phase system of alternating currents with a certain periodically repeated duration in time, wherein each pulse in the cluster of pulses has an amplitude that is proportional to an instantaneous amplitude of a major wave associated with the train of *m*-phase systems of alternating currents, and wherein each pulse in the cluster of pulses has a frequency that is proportional to an instantaneous frequency of the major wave associated with the train of *m*-phase systems of alternating currents.

2. (Currently Amended) A method of controlling the crystalline structure according to claim 1, wherein said *m*-phase systems of alternating currents ~~frequency and amplitude modulated by said method~~ are periodically switched on for a certain time interval and switched off with a certain time interval.

3. (Currently Amended) A method of controlling the crystalline structure according to claim 1 or 2, wherein ~~[[in]]~~ the process of continuous or semi-continuous casting, amplitude

~~modulation depth~~ and frequency deviation of each pulse in the cluster of pulses are periodically changed in time.

4. (Currently Amended) A method of controlling the crystalline structure according to claim 1 or 2, wherein ~~[[in]]~~ the ~~process of casting stationary ingots and castings,~~ amplitude ~~modulation depth~~ and frequency deviation of each pulse in the cluster of pulses are ~~growing~~ increased with increasing thickness of the crystallizing solid phase.

5-31. (Cancelled).